CHAPTER 10: MASTER CLAMP SECTION

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LED DRM1 180 Angular sensor
– Light up when magnetism is detected

THEORY OF OPERATION

1. Clamp Plate Opening System

- Opening of Clamp Plate

If the Position A sensor detects the Position A plate (if it is confirmed that the Drum is at the home position), at the same time, the Clamp solenoid is activated and the Clamp unit is pulled down, releasing the actuator of the Clamp safety switch (, which is pressed by the Clamp unit when the Clamp solenoid is not energized).

100 ms later, the Clamp motor starts rotating and opens the Clamp plate via gear engagement.

- Check of Opened Clamp Plate

When the 180° Angular sensor detects the Angular magnet on the Angular magnet plate, which is attached to one end of the Clamp plate shaft, the Clamp motor and Clamp solenoid are deactivated.

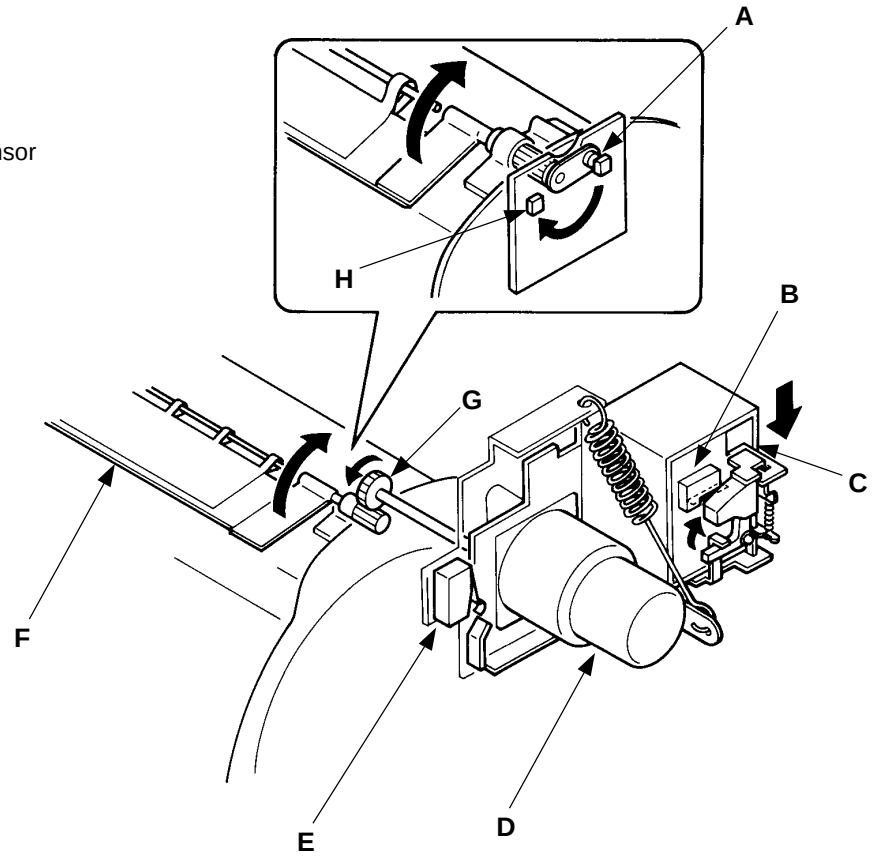
- Finish of Clamp Plate Operation

When the Clamp solenoid is deactivated, the Clamp unit is returned to the initial (retreat) position and presses the actuator of the Clamp safety switch, by which it is confirmed that the operation of opening the Clamp plate is finished.

- Protection of Clamp Solenoid

When the Clamp solenoid is energized, the Range setting switch is actuated ON to reduce the current flowing through the solenoid for protecting it against overheat.

A: Angular magnet
B: Range setting SW
C: Clamp solenoid
D: Clamp motor
E: Clamp safety SW
F: Clamp plate
G: Gear
H: 180° Angular sensor

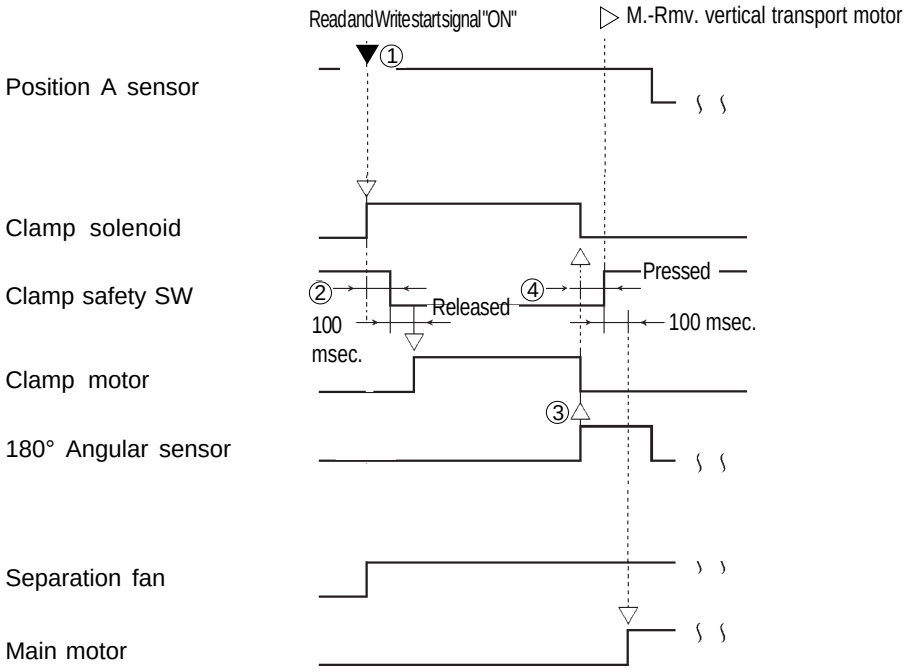


THEORY OF OPERATION

Test Mode No.10 180° Angular sensort
– Short interval beeps when magnetism is detected
No.70 Master removal fan
No.73 Clamp solenoid
No.104 Clamp opening/closing

- Timing Chart -

Clamp Plate Opening System



① If the Position A sensor does not detect the Position A plate before the Clamp plate opening operation starts, the Drum rotates until the sensor detects the Position A plate.

② If the Clamp safety switch has not been released OFF **within 4 seconds** after the Clamp solenoid is energized, the Clamp solenoid is deenergized and the Drum rotates once for the Position A.
Then the Clamp solenoid is energized once again.
If the Clamp safety switch has not been released OFF **within 4 seconds** again, the machine assumes a Clamp error-1 has occurred and indicates the error message **[T 3]**.

③ If 180° Angular sensor has not detected a magnet **within 8 seconds** after the Clamp motor is activated, the Clamp motor and Clamp solenoid are deactivated and the Drum rotates once for the Position A. Then the Clamp motor and Clamp solenoid is activated once again.
If the magnet has not been detected by the 180° Angular sensor **within 8 seconds** again, the machine assumes a Clamp error-1 has occurred and indicates the error message **[T 3]**.

④ If the Clamp safety sw has not been pressed **within 4 seconds** after the Clamp solenoid is deenergized, the machine assumes a Clamp error-1 has occurred and displays the error message **[T 3].**
- If the Clamp Safety switch is not pressed at other than clamp solenoid operation time, “T14 ” will be displayed.

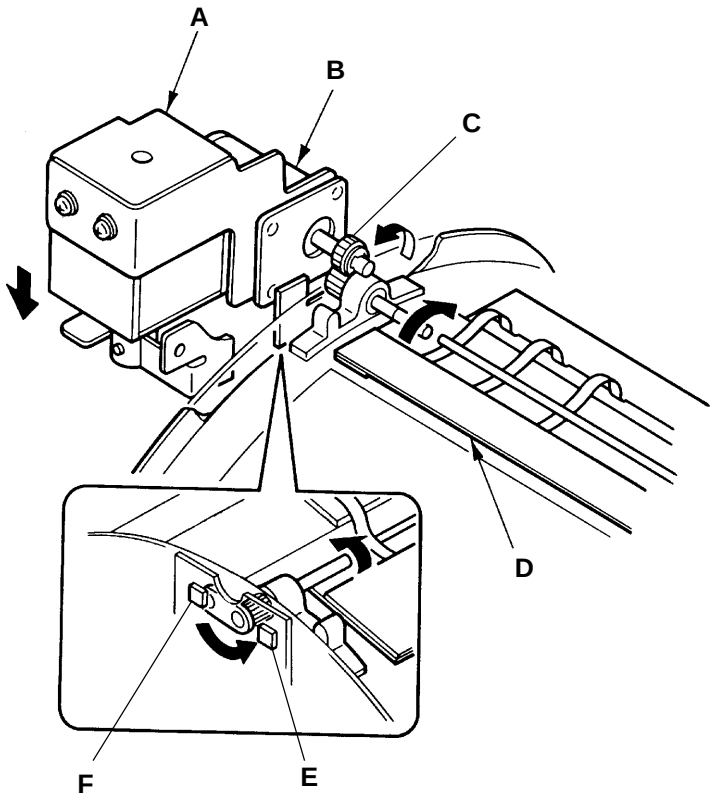
T3(Clamp Error (1))
• Clamp safety switch not turned on/off • 180° Angular sensor not turned on/off

T14(Clamp Error (2))
• Clamp safety switch not pressed at normal time

LED DRM0 0° Angular sensor
– Short interval beeps when magnetism is detected

2. Clamp Plate Closing System

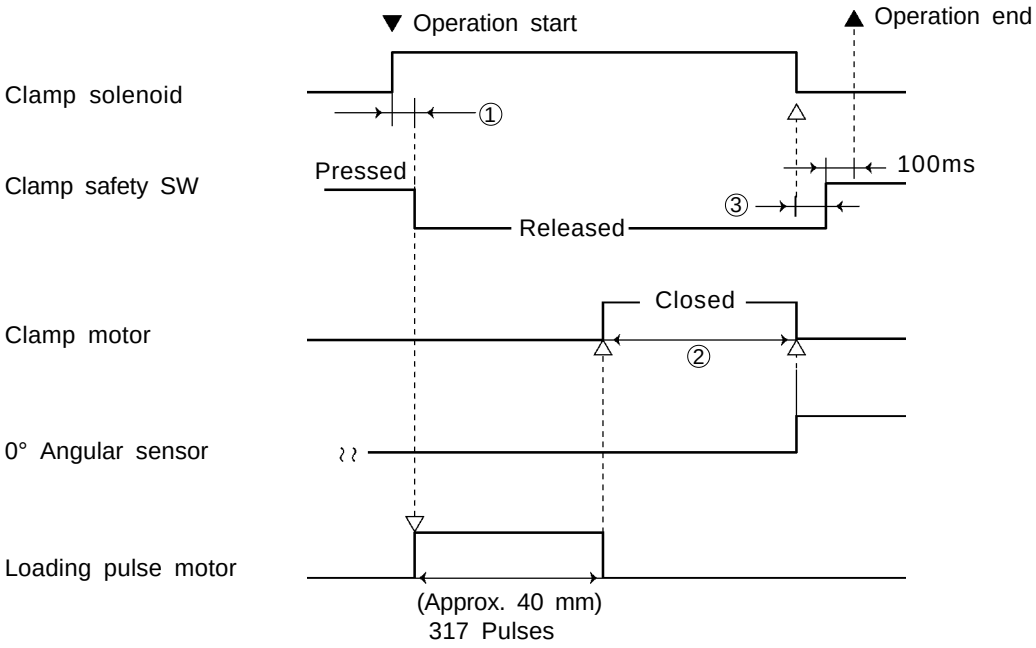
If the Drum comes back to the Position A in master removal vertical transport operation, the Clamp solenoid will be turned on and the Clamp unit will go down.
If it is confirmed that the Clamp safety switch has been released and the unit has moved down, the Loading pulse motor will be turned on to feed out the master over the drum.
Then, the Clamp motor will be turned on and start closing the clamp plate. If the 0° Angular sensor detects a magnet, the Clamp motor and clamp solenoid will be turned off. Once it is confirmed that the Clamp safety switch has been pressed and the Clamp unit has moved back upward, clamp plate closing operation will be completed(the Clamp Safety switch is normally pressed).



A: Clamp Solenoid
B: Clamp Motor
C: Gear
D: Clamp Plate
E: 0° Angular
F: Angular magnet

THEORY OF OPERATION

Test Mode No.9 0°Auguler sensor
– Short interval beeps when magnetism is detected
No.13 Clamp safety SW
– Short interval beeps when pressed
No.73 Clamp solenoid
No.104 Clamp opening/closing



① If the Clamp safety switch has not been released OFF within 4 seconds after the Clamp solenoid is energized, the Clamp solenoid is de-energized and Drum rotates once for the Position A.
Then the Clamp solenoid is energized once again.
If the Clamp safety switch has not been released OFF within 4 seconds again, the machine assumes a Clamp error-1 has occrred and indicates the error message **[T 3]**.

② If 0° Angular sensor has not detected a magnet within 8 seconds after the Clamp motor is activated, the machine assumes a Clamp error-1 has occurred and indicates the error message **[T 3]**.

③ If the Clamp safety SW has not been pressed within 4 second after the Clamp solenoid is de-energized, the machine assumes a Clamp error-1 has occurred and indicates the error message **[T 3]**.

* If the Clamp safety switch is not pressed at other than clamp solenoid operation time, “T14” will be displayed.

T3(Clamp Error (1))
• Clamp safety switch not turned on/off • 0° angular sensor not turned on/off

T14(Clamp Error (2))
• Clamp safety switch not pressed at normal time

Test Mode No.13 Clamp safety switch
– Short interval beeps when pressed
No.73 Clamp solenoid
No.104 Clamp opening/closing

REMOVAL & ASSEMBLY

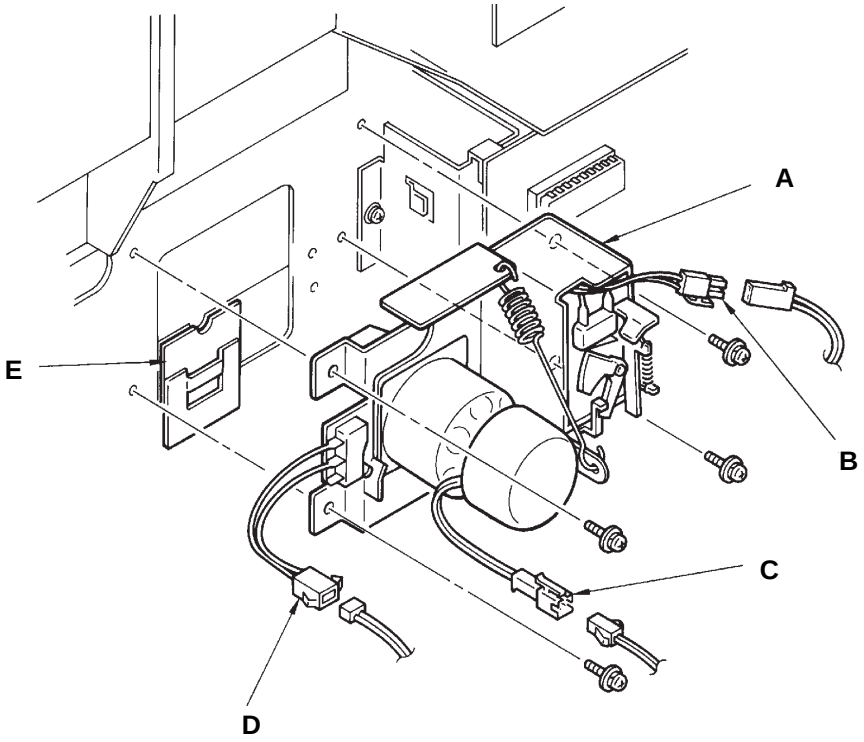
1. Clamp Unit

< Removal Procedure >

1. Turn OFF the power and remove the Back cover.
2. Disconnect the connectors of the wires coming out of the Clamp unit, i.e. Clamp solenoid, Clamp motor and Clamp safety switch.
3. Remove four mounting screws on the Clamp unit and remove the unit from the machine.

- Precautions in Assembly -

- M4x6 double-washer screws should be used in mounting the Clamp unit onto the machine. If longer screws are used, the screws will get contact with the Drum and interfere with the Drum rotation.



A: Clamp solenoid bracket
B: Clamp solenoid connector
C: Clamp motor connector
D: Clamp safety switch connector
E: Angular sensors

2. Clamp Motor

< Removal Procedure >

1. Remove the Clamp unit, referring to the previous page.
2. Remove four mounting screws of the Clamp motor and remove the motor from the Clamp unit.

- Precautions in Assembly -

- Put grease lightly on the Drive gear of the Clamp motor.
- Put locking bond on the mounting screws of the Calmp motor after attaching the motor back on the Clamp unit.

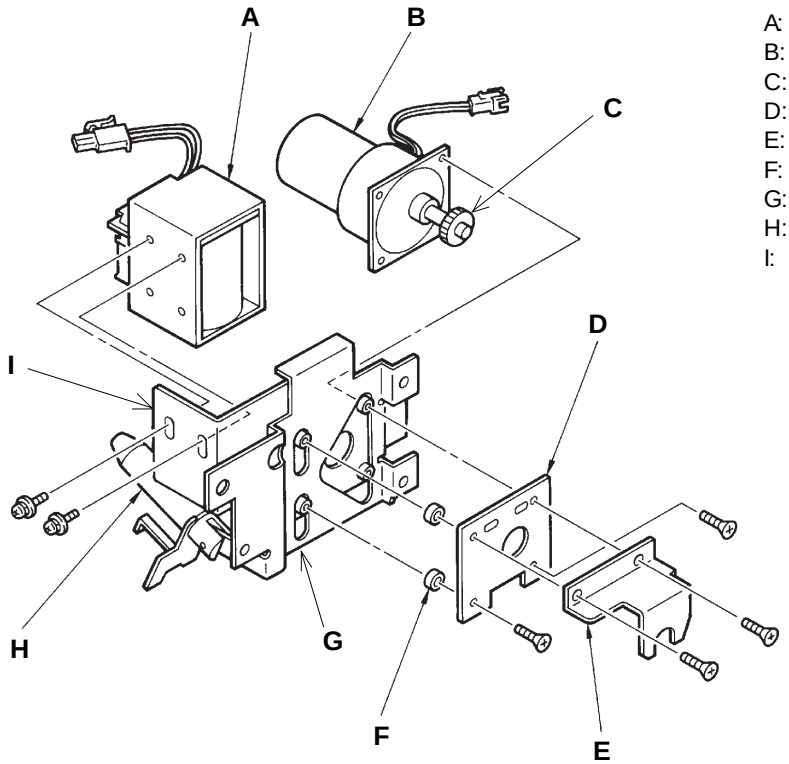
3. Clamp Solenoid

< Removal Procedure >

1. Remove the Clamp unit, referring to the previous page.
2. Remove two mounting screws of the Clamp solenoid and remove the solenoid from the Clamp unit, separating it from the Plunger.

- Precautions in Assembly -

- Put grease lightly on the sliding surface between the Clamp solenoid base plate and Clamp solenoid bracket.
- Attach the clamp solenoid to the bottom of the long holes.



A: Clamp solenoid
B: Clamp motor
C: Drive gear
D: Compensator plate bracket
E: Compensator plate
F: Compensator plate spacer
G: Clamp solenoid base plate
H: Plunger
I: Clamp solenoid bracket